

Mark Templeton, Director, *pro hac vice*
Robert Weinstock, Clinical Instructor, *pro hac vice*
Abrams Environmental Law Clinic
6020 South University Avenue
Chicago, Illinois 60637
(773) 702-9611
templeton@uchicago.edu
rweinstock@uchicago.edu

Kristine Akland
Akland Law Firm PLLC
PO Box 7274
Missoula, MT 59807
(406) 544-9863
aklandlawfirm@gmail.com

Attorneys for Amicus Curiae Professor Michael Greenstone

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
BILLINGS DIVISION**

WILDEARTH GUARDIANS

and

MONTANA ENVIRONMENTAL
INFORMATION CENTER

Plaintiffs,

v.

RYAN ZINKE, *et al.*

Defendants,

and

Case No. 1:17-cv-80-
SPW-TJC

**AMICUS BRIEF ON
BEHALF OF
PROFESSOR
MICHAEL
GREENSTONE**

SPRING CREEK COAL, LLC,

Intervenor-Defendant.

Professor Michael Greenstone, one of the leading economists on the social cost of carbon and former co-head of the federal Interagency Working Group (IWG) that developed the social-cost-of-carbon protocol, files this amicus brief to assist the Court in evaluating the Office of Surface Mining Reclamation and Enforcement's (OSM) analysis of climate impacts and omission of a social-cost-of-carbon analysis, which would reveal that roughly \$5 billion in climate-change costs are at stake here.

On June 8, 2017, Plaintiffs filed their *Complaint for Declaratory and Injunctive Relief*, challenging OSM's Environmental Assessment (Assessment) and Finding of No Significant Impact (Finding) for the proposed modification of Federal Coal Lease MTM 94378 (Expansion). This amicus brief is relevant to three of the National Environmental Policy Act (NEPA) claims: (3) failure to evaluate adequately greenhouse-gas pollution from combustion; (4) failure to consider cumulative actions; and (5) failure to prepare an environmental impact statement. *See* Complaint, ECF No. 1, at 17–24.

I. OSM’s Misleading Climate-Change Analysis Fails NEPA’s Hard-Look Requirement.

For “major” projects with significant environmental consequences, NEPA requires agencies to take a hard look at foreseeable environmental impacts. *See* 42 U.S.C. § 4332(C).

OSM found that an environmental impact statement was unnecessary based on its Assessment, which presented the Expansion’s greenhouse-gas emissions in proportion to national emissions as a proxy for climate impacts. Spring Creek Mine Federal Coal Lease MTM 94378 Mining Plan Modification, AR OSM016959, at OSM017031–OSM017035 (“EA”). This proxy is incomplete, inaccurate, and misleading; flouts climate science by characterizing the Expansion’s climate impacts as “short term” and “minor;” and frustrates the comparison of alternatives. Spring Creek Mine Federal Coal Lease MTM 94378 Mining Plan Modification (“FONSI”), AR OSM016953, at OSM016957.

A. OSM’s proxy does not translate the Expansion’s expected CO₂ emissions into actual climate impacts.

Although the Expansion will produce climate impacts through CO₂ emissions, emissions themselves are not impacts. Rather, climatic impacts that will be exacerbated or accelerated as a result of the Expansion’s marginal CO₂ emissions include changes in agricultural productivity, human health, ecosystem services, property, and other critical determinants of human well-being.

To translate marginal emissions into marginal impacts, agencies must use integrated climate assessment models, like those on which the social cost of carbon is based, or alternative methods to estimate damages to human well-being from emissions. *See Part II infra*. Instead of using these widely-available models to translate emissions into impacts, OSM's Assessment presents only Expansion emissions as a proxy for impacts. The Ninth Circuit rejected BLM's use of a similarly insufficient proxy in *Oregon Natural Resource Council v. U.S. Bureau of Land Management*, when the agency assessed a logging project's impacts by looking exclusively at the number of acres to be harvested. 470 F.3d 818 (9th Cir. 2006); *see also Ctr. for Bio. Diversity v. Nat'l Highway Traffic Admin.*, 538 F.3d 1172, 1216 (9th Cir. 2008) (rejecting assessment that "quantifie[d] the expected amount of CO₂ emitted" but failed to "evaluate the 'incremental impact' that these emissions will have on climate change"). OSM's proxy here suffers from the same problems: reciting a volume of pollution does not show what harms that pollution will cause.

B. OSM's proxy fails to provide a meaningful basis for comparing alternatives.

By only comparing each alternative's emissions to national CO₂ emissions and failing to assess the impacts of those emissions, OSM's proxy falsely depicts each alternative's impacts as insignificant, impeding meaningful comparison of

alternatives as NEPA requires. Despite the fact that OSM’s proposed action will produce *22.5 million more metric tons* of CO₂ annually than the no-action alternative¹—which has a social cost of approximately \$5 billion (*see* Part II *infra*)—OSM concludes that the climate impacts from the No Action alternative “would be similar to those under the Proposed Action.” EA, at OSM017032. OSM’s proxy transforms a multi-million-ton difference in annual CO₂ emissions—and multi-billion dollar difference in cost—into statistical insignificance.

OSM’s approach is tantamount to claiming that an action that leads to the premature death of 10,000 people is irrelevant because many more people die each year around the world. In a world with over seven billion people, virtually all actions can be made to seem small, but that merely disguises the issue at hand. By drawing a comparison to total emissions, OSM hides the key question of what the environmental and socioeconomic impacts of each alternative are, as well as whether benefits exceed those costs.

The Ninth Circuit rejected similar efforts to obfuscate the impacts of CO₂ in *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172 (9th Cir. 2008). There, NHTSA’s cost-benefit analysis violated NEPA by effectively pricing costs of CO₂ emissions at the obviously inaccurate value of zero dollars. *See id.* at 1200. OSM

¹ OSM estimates the proposed action will emit 31.1 million metric tons of CO₂ annually, compared to 8.6 million metric tons for the no action alternative.

has done the same in its Assessment by declaring that the proposed action and the no-action alternative will have equivalent climate impacts despite the massive difference in CO₂ emissions.

Although the *Western Organizations Resource Council v. BLM* decision declined to overturn a similar proxy, the court limited its discussion to two paragraphs that broadly deferred to an “agency’s scientific judgments.” No. CV 16-21-GF-BMM, 2018 WL 1475470, at *14 (D. Mont. Mar. 26, 2018) (“*WORC*”). However, as explained above, OSM’s judgments ignore basic science. The *WORC* decision never considered the aforementioned flaws of such a proxy, flaws this brief seeks to elucidate to assist the Court’s review.

C. OSM’s proxy ignores cumulative impacts by focusing on the expected rate of CO₂ emissions without considering atmospheric concentrations.

To analyze the marginal impacts of a project’s CO₂ emissions on the environment, one must know at least two things: (1) how much CO₂ will be emitted; and (2) how much CO₂ will *already be in the atmosphere* when the emissions occur. Assessing impacts of additional CO₂ can be likened to knowing when a running faucet will overflow a partially-filled and slow-draining bathtub; one must know both the faucet’s rate and the volume of water already in the tub.

Understanding the latter fact matters in the case of climate change because CO₂ has cumulative, non-linear impacts. While atmospheric concentrations of CO₂

increase along a linear path as more CO₂ is emitted, the climatic impacts of emissions increase along a steeper, non-linear slope as physical and economic systems become more stressed in response to greater climatic change. Furthermore, because CO₂ remains in the atmosphere for centuries or longer, CO₂ emissions produce cumulative, long-term impacts. To assess meaningfully the cumulative, long-term impacts of the CO₂ emissions of a project, an agency must have a scientifically sound understanding of baseline atmospheric CO₂ concentrations.

OSM ignores these basic principles by considering *only* the Expansion's expected rate of CO₂ emissions. OSM never analyzes those additional emissions in the context of atmospheric CO₂ concentrations, *despite* acknowledging the importance of atmospheric concentrations elsewhere.² Inaccurately, OSM concludes that "direct and indirect effects from [greenhouse-gas] emissions" will be "short term." EA, at OSM017031, OSM017033 (concluding same for "cumulative effects"). The faulty conclusion reached by OSM's Assessment, however, is founded on an incoherent understanding of the cumulative, long-term effects of CO₂ emissions.

² See, e.g., EA, at OSM016989 ("There is substantial scientific evidence that increased atmospheric concentrations of greenhouse gases . . . contribut[es] to increases in average global temperatures."); OSM017000 (noting "long-term impacts [greenhouse gases] have on climate because of their increased incremental levels in the earth's atmosphere").

II. Using the Social-Cost-of-Carbon Protocol Would Remedy the Problems with OSM's Proxy.

Rather than arbitrarily deploying a technically-unsound and misleading proxy, OSM could have satisfied NEPA by using the scientifically-supported and informative social-cost-of-carbon protocol.

A. Background on the Social Cost of Carbon

The IWG developed the social-cost-of-carbon methodology for quantifying damages associated with an increase in CO₂ emissions so that policymakers could make informed decisions about actions that affect climate. The IWG process included subject-matter experts from the Department of Interior, six additional federal agencies, and six executive offices, and synthesized the best available science. The IWG selected three integrated assessment models—the DICE, FUND, and PAGE models—as the best available models for quantifying climate-change damages. These models are broadly supported by experts including the Intergovernmental Panel on Climate Change, which seeks to provide an objective, scientific view of climate change. Each model calculates climate impacts from inputs including the cumulative atmospheric greenhouse-gas concentration and the trajectory of emissions. The models then calculate expected monetary damages from projected climate impacts, such as changes in agricultural productivity, human health effects, property effects, and ecosystem services. Based on these

models, the IWG developed a set of central estimates of the social cost of carbon for 2010 through 2050. *See* AR OSM018901, at OSM018906 (containing IWG, *Technical Support Document* (Feb. 2010)). The central estimates represent a comprehensive calculation of the costs associated with each marginal ton of carbon emitted in a given year. *Id.* at OSM018901.

Following its initial 2010 report, the IWG updated the social-cost-of-carbon value multiple times using the same expert methodology. *See* AR OSM018299 (containing IWG, *Technical Support Document: Technical Update* (July 2015)). The most updated central estimate for the social cost of carbon in the administrative record here is approximately \$39.60 (in 2007 dollars) per metric ton of CO₂ emitted. *See* AR OSM018299, at OSM018301 (summarizing schedule of values from 2010–2050).

The social-cost-of-carbon protocol has been cited in numerous academic studies, implemented by states and nations, used in over 80 federal rulemakings and assessments, and has been upheld by courts in the NEPA context. *See, e.g., High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1190–93 (D. Colo. 2014); *Mont. Env'tl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1094–99 (D. Mont. 2017) (“MEIC”); *Sierra Club v. FERC*, 867 F.3d 1357, 1375 (D.C. Cir. 2017). The social-cost-of-carbon protocol is readily available for use in a proper NEPA review of the Expansion.

B. The social-cost-of-carbon protocol remedies the problems with OSM's proxy.

Unlike OSM's proxy, which wrongly uses a meaningless annual national-emissions denominator, the social-cost-of-carbon protocol accounts for atmospheric CO₂ concentrations and connects emissions to actual impacts. As described above, the integrated assessment models underlying the social-cost-of-carbon value convert (1) incremental CO₂ emissions into changes in atmospheric greenhouse-gas concentrations and (2) changes in atmospheric concentrations into changes in temperature. The social-cost-of-carbon protocol then (3) connects changes in temperature to effects on agriculture, sea level, human health, and ecosystems, and (4) translates these effects into the present value of these costs. These steps produce a cost associated with each marginal ton of CO₂ emitted into the atmosphere.

By monetizing social costs of climate change, the social-cost-of-carbon protocol presents climate impacts and facilitates comparing actions with different levels of CO₂ emissions in a way that OSM's proxy does not. Generalized descriptions of a warming planet and rising seas, as provided in the Assessment, provide no means to decide among different alternatives. Putting those impacts into a common economic unit (i.e., dollars) does just that. Furthermore, it allows

for a determination of whether an action is socially desirable by clearly showing its environmental costs to compare with any benefits.

C. Applying the social-cost-of-carbon protocol is essential to this Court’s review of OSM’s Finding.

The social-cost-of-carbon protocol provides high-quality information about the Expansion’s climate impacts that aids this Court’s review of OSM’s finding of “no significant impact.”

OSM concedes that the Expansion will emit more than 146,000,000 metric tons of CO₂e. *See* EA, at OSM017031–OSM017032 (using carbon dioxide equivalent or CO₂e “[t]o allow different gases to be compared and added together”). Applying the social-cost-of-carbon protocol to these emissions—but considering them as if they occurred between 2016 and 2020, the timeframe used by the Assessment—reveals that the Expansion will cost society well over \$5 billion from climate-related impacts, based on the numbers in this administrative record. This lays bare the irrationality of OSM’s Finding that although the Expansion will cause \$5 billion in climate-change damages, it has no “significant impact.”

III. OSM’s reasons for rejecting the social-cost-of-carbon protocol are arbitrary and irrational.

A. There is no reason to attribute only some fraction of the social cost of carbon to the coal producer.

OSM asserts that it cannot use the social-cost-of-carbon protocol because it cannot attribute a fraction of the social cost of carbon to the coal producer as distinct from other entities that contribute to the combustion of Expansion coal. EA, at OSM017035 (claiming “no consensus on the appropriate fraction of [the social-cost of carbon] ... that should be assigned to the coal producer”). OSM misunderstands the social-cost-of-carbon protocol and NEPA. *See* Plaintiffs’ Brief, ECF No. 38, at 13.

First, OSM’s Assessment is inconsistent regarding fractionalization. OSM presents projected greenhouse-gas emissions without any ‘fractionalization’ among coal miners and coal combustors. *See* EA, at OSM017032. If fractionalization of impacts were analytically necessary, then OSM would be bound to fractionalize emissions as a proxy for impacts, but it does not do so.

Second, NEPA requires consideration of *all* reasonably foreseeable downstream impacts, direct and indirect. 40 C.F.R. § 1508.8(b) (2018) (requiring analysis of “indirect effects ... [on] land use ... growth rate ... air and water and other natural systems, including ecosystems”). NEPA does not require—and provides no basis for— fractionalizing downstream effects and considering only

some. Courts, including this one, have held that indirect effects of coal mining include greenhouse-gas impacts from combustion. *See, e.g., MEIC*, 274 F. Supp. 3d at 1094–99 (indirect effects include emissions from coal combustion); *Sierra Club*, 867 F.3d at 1374 (indirect effects include “downstream greenhouse emissions ... from burning the natural gas”). Allocating responsibility for impacts along a causal chain—i.e., fractionalization—is foreign to NEPA.

Finally, OSM need not fractionalize the social cost of carbon because it is not designed to be fractionalized: the underlying models capture *all* predictable downstream impacts of marginal CO₂ emissions. Because the social-cost-of-carbon method models the total, system-wide impact of emissions, the protocol is both well-suited to a NEPA analysis of all downstream effects and indifferent to whether multiple entities contribute to its emission.

B. Uncertainty about the degree of substitution is not a valid reason to reject the social-cost-of-carbon protocol.

OSM rejects the social-cost-of-carbon protocol by claiming uncertainty regarding the degree to which power plants likely to burn Expansion coal would find a substitute source of coal—or switch fuels—under the no action alternative. *See* EA, at OSM017035 (asserting “no certainty that emissions at power plants would actually be reduced”). However, economic modeling can resolve this

“uncertainty,” and courts have rejected unsubstantiated allegations about the potential for substitution. *See* Plaintiffs’ Brief, ECF No. 38, at 13–15.

Contrary to OSM’s approach, it is feasible and useful to project the net effects on greenhouse-gas emissions from substitution. Given market data on available energy alternatives in the relevant energy market (*e.g.* natural gas and renewables), a substitution model can calculate the greenhouse-gas emissions resulting from the mix of energy resources likely to meet demand.

Utilization of modeling to improve coal-leasing decisions is not theoretical. A recent supplemental final environmental impact statement by the U.S. Forest Service examined market data to estimate substitution for the North Fork Coal Mining Area in Colorado. U.S. Dept. of Agriculture, Forest Service, Supplemental Final Environmental Impact Statement, Rulemaking for Colorado Roadless Areas (November 2017), at 112–13. This example is not offered to endorse all aspects of the Forest Service’s market analysis, but rather to illustrate that such analysis is feasible. Moreover, the Tenth Circuit recently held that NEPA requires agencies to support claims about substitution with data. *Wildearth Guardians v. U.S. BLM*, 870 F.3d 1222, 1235 (10th Cir. 2017) (rejecting under NEPA “assertion that coal would be substituted from other sources” because it was “unsupported by hard data”). Uncertainty and lack of data are reasons for further analysis, not reasons to end it.

Moreover, OSM is being inconsistent again. Just as with its erroneous fractionalization argument, if OSM were correct that substitution analysis is necessary to evaluate impacts using the social-cost-of-carbon protocol, then it would be equally necessary to evaluate impacts using its emissions “proxy” approach, but OSM performs no such analysis. *See* EA, at OSM017032.

C. Using the social-cost-of-carbon protocol does not require quantifying other costs and benefits, and even if it did, OSM has quantified the project’s anticipated benefits.

OSM’s final reason for eschewing a social-cost-of-carbon analysis is that “in order to provide any meaningful insight, the projected social cost of carbon would need to be viewed in context with other costs and benefits.” EA, at OSM017035. A fulsome cost-benefit analysis is a sound-basis for decision-making, however OSM misunderstands the social-cost-of-carbon protocol and overlooks its existing quantification of economic benefits.

Initially, OSM takes a mistakenly limited view of the social cost of carbon in NEPA analyses. It is not confined to formal cost-benefit analyses, but rather, as described above, the social cost of carbon is the best available method for assessing and presenting actual climate impacts of an action.

Additionally, the social cost of carbon is an excellent tool for taking a hard look under NEPA because it focuses on social and economic costs interrelated with

climate change. NEPA and its implementing regulations distinguish between environmental impacts—which are essential to NEPA analysis—and socioeconomic impacts—which are relevant insofar as they interrelate with environmental impacts.³ The social cost of carbon is designed to capture exactly that universe of impacts, whatever other information is presented.

Even if benefits context were necessary to use the social-cost-of-carbon tool, the Assessment already provides such context by quantifying economic benefits. *See* Plaintiffs’ Brief, ECF No. 38, at 15, 21. The Assessment includes multiple sections devoted to “Socioeconomics,” describing “substantial economic benefits” (EA, at OSM017059) and quantifying government royalties (EA, at OSM017014), expected tax revenues (EA, at OSM017059), jobs and payroll (EA, at OSM017014–OSM017015), and the economic value of coal produced (EA, at OSM017013–OSM017014).⁴ Including these quantified economic benefits means OSM must include quantified costs under NEPA, because when agencies quantify benefits, they must treat costs similarly. *See MEIC*, 274 F. Supp. 3d at 1098 (cannot “quantify socioeconomic benefits while failing to quantify costs”). The

³ Federal regulations define “human environment” as including the “natural and physical environment and the relationship of people with that environment” and requires analysis of “interrelated” “economic or social” effects. 40 C.F.R. § 1508.14 (2018).

⁴ The Assessment does not state the value of the coal, but it provides figures needed to calculate that value.

emphasis on economic benefits makes this Assessment indistinguishable from that rejected in *MEIC*. See Plaintiffs’ Brief, ECF No. 38, at 13–16. The same benefits are touted—payroll value and tax revenues—without the necessary balance of a social-cost-of-carbon analysis. 274 F. Supp. 3d 1074, 1094.⁵

CONCLUSION

OSM’s climate change analysis fails to present the actual climate change impacts of the Expansion and irrationally concludes that \$5 billion in damages is not a “significant impact.” As a leading expert on evaluating climate-change costs to improve decision-making, I find OSM’s analysis to be incoherent, incomplete, and unhelpful with respect to NEPA’s requirements and purposes.

DATED this 14th day of May, 2018.

/s/ Kristine Akland
Kristine Akland
AKLAND LAW FIRM PLLC

/s/ Robert Weinstock
Mark Templeton *pro hac vice*
Robert Weinstock *pro hac vice*
Abrams Environmental Law Clinic
Attorneys for Amicus Curiae
Professor Michael Greenstone

⁵ The recent *WORC* decision is not to the contrary. 2018 WL 1475470. The environmental impact statements there discussed benefits qualitatively, without monetization. Thus, that court’s tolerance of using emissions “as a proxy ... of global climate change effects,” though wrong as a technical matter in any context, is only applicable to the limited context of reviewing an environmental assessment that did not quantify any benefits. *Id.* at *14.

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION

Pursuant to L.R. 7.1(d)(2), I certify that this brief contains 3,243 words. I relied on my Microsoft Word word-processing tool to obtain the word count.

Respectfully submitted on May 14, 2018,

/s/ Robert Weinstock
Attorney for Amicus Curiae Professor
Michael Greenstone

CERTIFICATE OF SERVICE

I hereby certify that I caused a copy of the foregoing to be filed with the Clerk of the Court using the CM/ECF system, thereby serving it on all parties of record on May 14, 2018.

/s/ Robert Weinstock
Attorney for Amicus Curiae Professor
Michael Greenstone